Serial No. 09/868,566
Art Unit: 1712

IN THE CLAIMS

Claims 1-14 Cancelled.

15. (Currently amended) A structural adhesive composition with good low temperature impact strength which comprises:

A) A copolymer having at least one glass transition temperature of -30°C or lower and epoxy-reactive groups or a reaction product of this copolymer with a polyepoxide;

B) A reaction product of a polyurethane prepolymer and a polypenol or aminophenol;

C) At least one epoxy resin [[.]];

D) A hardener and optionally a hardening accelerator;

E) Optionally plasticizers, reactive diluents, rheology aids, fillers, wetting agents antiagers and stabilizers;

F) At least one polyester polyol with a molecular weight of 400 to 5,000; and

G) Optionally a thermoplastic polymer powder.

16. (Previously entered) The composition claimed in claim 15, wherein component A) comprises a butadiene-based copolymer.

17. (Previously entered) The composition claimed in claim 16, wherein the copolymer of component A) comprises a carboxyl-containing copolymer based on at least one member selected from the group consisting of butadiene/acrylonitrile, butadiene/(meth)acrylate copolymer, butadiene/acrylonitrile/styrene copolymer and butadiene/(meth)acrylate/styrene copolymer.

18. (Previously entered) The composition claimed in claim 15, wherein the copolymer of component A) comprises a core/shell polymer of which the core polymer is a diene polymer or a (meth)acrylate polymer with a glass transition temperature of -30°C or lower and which may optionally be crosslinked with 0.01 to 5% by weight of a diolefinic comonomer and of which the shell polymer has a glass transition temperature of 60°C or higher and contains residues of at least one monomer selected from the group consisting of alkyl (meth)acrylate, (meth)acrylonitrile, (methyl) styrene, olefinically unsaturated carboxylic acids, olefinically unsaturated carboxylic anhydrides and mixtures thereof.

19. (Previously entered) The composition claimed in claim 15 wherein component A comprises an adduct of an epoxy resin and a butadiene based copolymer.

20. (Currently amended) The composition claimed in claim 15 wherein component B) comprises a compound of the formula:

R^1-[X-(C=O)-NH-R^2-NH-(C=O)-Y-R^3-$(Z)_m]_n$ (I)

in which

m = 1 or 2,

n = 2 or 3,

R^1 is a residue of a polyalkylene glycol after removal of the functional groups (hydroxyl or amino groups),

R^2 [[=]] is C_{6-14} alkyl, aryl, aralkyl (residue of a diisocyanate after removal of the isocyanate groups),

X,Y [[=]] is -O-, -S- or -NR^4-, where R^4 = H or C_{1-4} alkyl or phenyl,

R^3 is a carbocyclic-aromatic or araliphatic m+1-functional residue with groups Z directly attached to ~~the~~ an aromatic ring and Z [[=]] is -OH or -NHR^4 (residue of a polyphenol or aminophenol after removal of the functional groups).

21. (Previously entered) The composition claimed in claim 15, wherein component B) is dissolved in a liquid polyepoxide.

22. (Previously entered) The composition claimed in claim 15, wherein component B) is reacted with a stoichiometric excess of a polyepoxide.

23. (Currently amended) The composition claimed in claim 15 ~~further comprising~~ wherein

D) comprises a latent hardener selected from the group consisting of dicyanodiamide, guanamines, guanidines, aminoguanidines, solid aromatic diamines and mixtures thereof and optionally a hardening accelerator~~; and~~

~~E)optionally plasticizers, reactive diluents, rheology aids, fillers, wetting agents, antiagers and stabilizers~~.

24. (Previously added) A cured composition of claim 15 having an impact peel energy of at least 5 J at -20°C (to ISO 11343).

25. (Previously added) The production of composite materials, potting compounds in the electrical and electronics industries and die-attach adhesive for the production of circuit boards in the electronics industry wherein the adhesive comprises the composition of claim 24.

26. (Cancelled)

27. (Currently amended) The method ~~A process~~ for hardening a composition of claim ~~26~~ 15 which comprises heating the composition to a temperature of 80°C to 210°C.

28. (Currently amended) A ~~process~~ method for bonding members selected from the group

consisting of metallic materials, ~~and/or~~ composite materials and combinations thereof comprising:

[[•]] 1) applying ~~the~~ an adhesive composition ~~claimed in claim 26 to at least one of the substrate surfaces to be joined, optionally after cleaning and/or surface treatment~~ comprising:

A) 5% to 25% by weight of the adhesive composition of a copolymer with at least one glass transition temperature of -30°C or lower and groups reactive with epoxy resins or a reaction product of the copolymer with a polyepoxide in stoichiometric excess;

B) 5% to 30% by weight of the adhesive of a product of the reaction of a polyurethane prepolymer, a polyphenol or an aminophenol;

C) 19% to 60% by weight of the adhesive of an epoxy resin, wherein the epoxy resin comprises a mixture of liquid and optionally solid epoxy resins and optionally low molecular weight epoxy resins as reactive diluents;

D) 1% to 10% by weight of the adhesive of a hardener, to one of the ~~substrate~~ surfaces of a substrate to be joined, optionally after at least one of cleaning and~~/or~~ surface treatment;

[[•]]2) fitting the ~~parts~~ substrates to be joined together;

[[•]] 3) optionally pregelling the adhesive composition; and

[[•]] 4) curing the ~~bond~~ adhesive composition by heating the ~~parts~~ substrates to a temperature of from 80°C to 210°C[[.]]; whereby, a joint with a lap sheer strength at room temperature of at least 15 Mpa and a lap shear strength at 90°C greater than 10 Mpa, when the substrates are steel, are formed, and wherein a low temperature impact resistance measured according to ISO11343 at -20°C as impact peel energy is at least 5J at 2m/sec and wherein B) comprises residues of at least one of hydroxy or amino terminated polytetramethylene glycols.

29. (Currently amended) The ~~process~~ method of claim 28 wherein the ~~bond~~ adhesive is cured at a temperature of from 120°C to 180°C.

30. (Currently amended) The ~~process~~ method of claim 27 wherein the composition is heated at a temperature of from 120°C to 180°C.

31. (New claim) The method of claim 28 wherein the adhesive further comprises;

D) a latent hardener selected from the group consisting of dicyanodiamide, guanamines guanidines aminoguanidines, solid aromatic diamines and mixtures thereof and

optionally a hardening accelerator;

E) optionally plasticizer, reactive diluents, rheological auxiliaries, fillers, wetting agents, antiagers and mixture thereof.

F) a polyesterpolyol with a molecular weight of form 400 to 5,000; and

G) optionally a thermoplastic polymer powder.

32. (New claim) The method of claim 28 wherein B) comprises a compound of the formula:

R^1-[X-(C=O)-NH-R^2-NH-(C=O)-Y-R^3-$(Z)_m]_n$

33. (New claim) The structural adhesive of claim 15; wherein,

A) comprises from 5% to 25% by weight of the adhesive;

B) comprises 5% to 30% by weight of the adhesive;

C) comprises 10% to 60% by weight of the adhesive; and

D) comprises 1% to 10% by weight of the adhesive.